INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 07 Issue 05 May 2024

DOI: 10.47191/ijmra/v7-i05-18, Impact Factor: 8.22

Page No. 1957-1963

Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach

Tuhin G M Al Mamun [1], EHSANULLAH [2*]

[1,2] Department of Economics, Hannam University, Hannam Ro, 70, Daeduck Gu, 34430 Daejeon, South Korea

ABSTRACT: This paper investigates labor market dynamics from 1990 to 2023 using the McCall dynamic programming search model, offering insights into individual decision-making, economic conditions, and policy implications. Convergence trends in wage predictions underscore the model's reliability, highlighting its utility for predicting wage outcomes over time. The policy implications emphasize the importance of balancing the duration of unemployment and the considerations of the wage level in policy design. In light of the analysis, policymakers and employers should consider the trade-offs between unemployment duration and wage level when designing policies and compensation practices. The insights provide guidance for policymakers, employers, and job seekers in navigating the complexities of the job market.

INTRODUCTION

Unemployment is a big problem that affects many people in South Korea and around the world. Even though the country is doing well economically and technologically, it can still be hard to find a job because the job market is always changing and can be challenging. To fix this problem, we need to understand how unemployment works and use that knowledge to create policies that can help people find work and make the economy stronger.

There is a model called the McCall search model that helps us understand how people look for jobs and what they think about when they decide which job to take. This model considers things like how much money they expect to make, how long it will take to find a job, and if there is any government help for people who can't find a job.

This model can help us understand why it can be hard to find a job in South Korea. The country has gone through a lot of changes over the years, from farming to factories to knowledge-based work. This means that the types of jobs that are available, the skills people need, and how secure a job is have all changed.

South Korea has some big challenges, like an aging population and not enough babies being born. Because of these things, it can be hard for people to find a job. There are also some rules and policies that make it hard for people to find work, and some people don't have the same chance to get a good education or a good job. All of these things together make it hard for people in South Korea to find a good job that they like and that is secure.

Therefore, studying how the McCall search model can be used to understand unemployment in South Korea can provide us with insights on how to make the job market more accessible to the people and, in turn, make the economy more stable.

LITERATURE REVIEW

Unemployment has been a persistent issue that has affected many economies for a long time. Several studies have been conducted to gain a better understanding of this problem. The McCall search model is a theoretical framework that has aided in comprehending how individuals make decisions regarding their labor market. The McCall model which was introduced by McCall[6] in 1970 which offers valuable insights of an individual decision-making process on job search.

This model also explores the trade-offs between accepting a job offer immediately or continuing to search for a job for more better opportunity. Though 50 years have passed,still the McCall search model is considered relevant in ccontext of present labor market.Researchers such as Alvarez and Veracierto (2000)[9] and Fujita and Ramey (2009)[3] have examined the duration of unemployment as a critical factor. They have investigated a variety of factors, including worker profiles, labor market circumstances, and policy initiatives, to better understand the length of unemployment spells.

These findings demonstrate the need to consider heterogeneity and dynamic interactions when assessing unemployment spells, which is consistent with the McCall model's ideas. Researchers have been investigating the influence of individual reservation wages on labor market outcomes, also known as wage determination. Elsby et al. (20100)[1] and Kroft et al. (2013)[5] conducted empirical investigations employing large-scale datasets and advanced econometric approaches to shed light on the factors that govern wage determination. These investigations are consistent with the theoretical basis of the McCall model.

Programs that offer financial aid or job search assistance to jobless people have been studied by specialists. To be effective, such programs must be designed to motivate job seekers to look for jobs. The McCall search model has helped academics understand how individuals look for employment and establish successful job-seeker assistance programs. Rothstein (2011)[8] and Farber (2015)[2] studied how unemployment insurance policies and changes in the job market affect how people look for work and their job prospects. Their research shows that it's important for the government to create policies that take into

Consideration the challenges that job seekers face. These policies should be tailored to meet the needs of jobless individuals and should be based on the McCall search model's assumptions. With the advancement of technology, researchers can now use the McCall search model to gain insights into labor market trends. Recent studies, such as Hagedorn et al. (2015) [4] and Merkl and Stolte (2016)[7], employ dynamic stochastic general equilibrium (DSGE) models and structural estimation methods to investigate how labor market frictions and search behavior impact unemployment dynamics.

These studies connect microeconomic principles to macroeconomic dynamics, leading to a better understanding of the aggregate effects of individual decision-making processes, and thus improving our understanding of labor market dynamics. Researchers have made significant progress in comprehending the intricacies of the labor market and shaping policy debates that aim to decrease unemployment and promote economic stability in contemporary settings. This progress has been achieved by merging insights from theoretical models, empirical studies, and methodological advances.

DATA COLLECTION METHOD

To study the period of unemployment rates from 1990 to 2023, we collected data from the Federal Reserve Economic Data (FRED) database. We used this database for reliable and comprehensive macroeconomic data that includes unemployment rates. We downloaded the data directly from the FRED website to ensure the accuracy and consistency of the dataset. We applied techniques to clean and process the data to handle missing values and ensure data integrity. This collected data was then used to analyze the factors influencing unemployment duration and wage determination over the given period using the McCall search model.

MODEL FORMULATION

The McCall search model comprises two fundamental equations that encapsulate the decision-making process of an unemployed worker in the labor market.

1 Bellman Equation: The first equation, known as the Bellman equation, represents the dynamic programming problem that the unemployed worker faces. It encapsulates the value function that determines the maximum expected utility or value that the worker can attain at each point in time. The Bellman equation is expressed as follows:

$$V(w) - \max\left\{\frac{w}{1-\beta}, c + \beta \sum_{i=1}^{n} V(w_i)p_i\right\} \quad (1)$$

Where:

- w_i are possible wage offers in the next period.
- p_i is the probability mass function for observing wage offer w_i.
- $V(w)$ is the value function, representing the total lifetime value associated with being in a state characterized by a wage offer w.
- $1w$ is the wage offer in the current period.
- β is the discount factor, reflecting the worker's time preference.
- c is the level of unemployment compensation.
- w_i are possible wage offers in the next period.
- p_i is the probability mass function for observing wage offer w_i.

Reservation Wage Equation

In the McCall model, the optimal policy (w) is a crucial determinant of an unemployed worker's decision-making process regarding whether to accept or reject a wage offer w.

Formally, the optimal policy is defined as:

$$\text{sigma}(w) - \begin{cases} 1 & \text{if } w \geq \bar{w} \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

- where $\bar{w}$ represents the reservation wage

The reservation wage is the wage level at which the worker is indifferent between accepting a job offer and remaining unemployed. It serves as a threshold: if the wage offer w is greater than or equal to the reservation wage, the worker accepts the job offer $(\sigma(w) - 1)$; otherwise, the worker rejects the offer and continues the job search $(\sigma(w) - 0)$.

The reservation wage equation determines the minimum wage level at which the worker is willing to accept a job offer, known as the reservation wage. It is given by:

$$\bar{w} - (1 - \beta)\left\{c + \beta \sum_{i=1}^{n} V(w_i)p_i\right\} \quad (3)$$

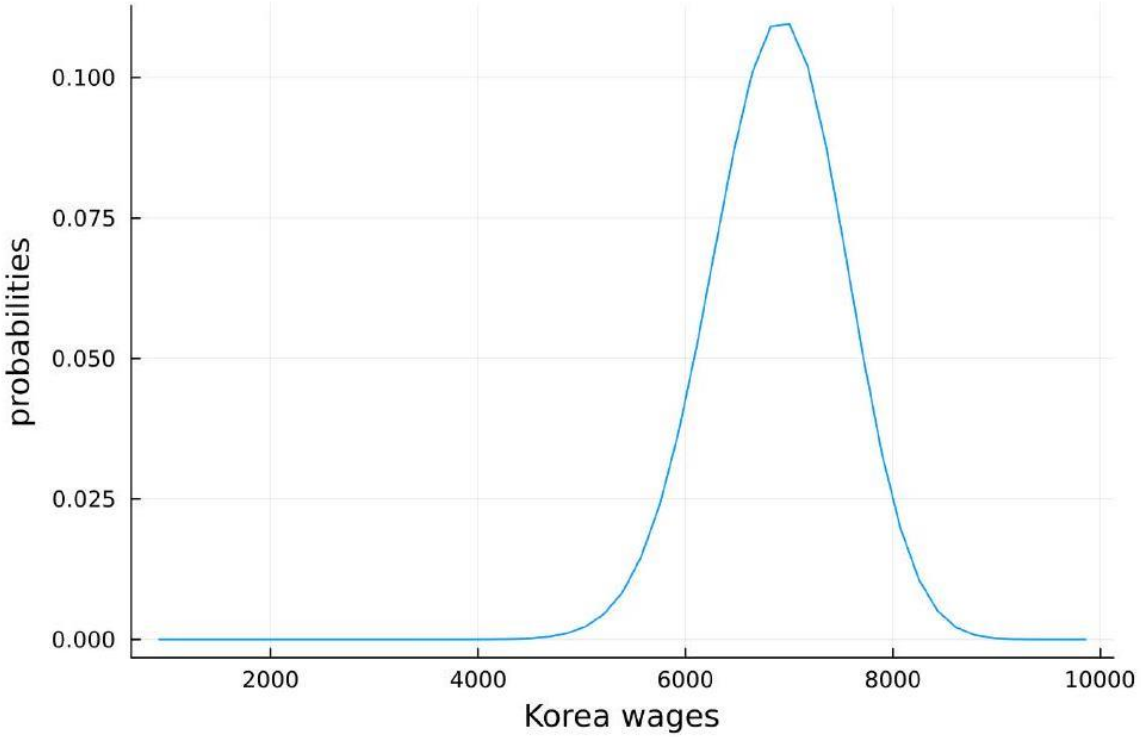
Where:

- $\bar{w}$ is the reservation wage.
- w_i are possible wage offers in the next period.
- p_i is the probability mass function for observing wage offer w_i.
- where c is the level of unemployment compensation,
- β is the discount factor,
- $V(w_i)$ is the value function for each possible wage offer w_i and
- p_i is the probability mass function for observing wage offer w_i.

In essence, the optimal policy guides the worker's decision to either accept or reject a wage offer based on whether it exceeds the reservation wage, thereby influencing the worker's employment outcomes and overall welfare.

These equations form the core of the McCall search model, providing a rigorous framework for analyzing individual decision-making in the labor market context. They enable us to understand how unemployed workers weigh the immediate benefits of job offers against the potential for better opportunities in the future, thereby shedding light on the dynamics of unemployment duration and wage determination

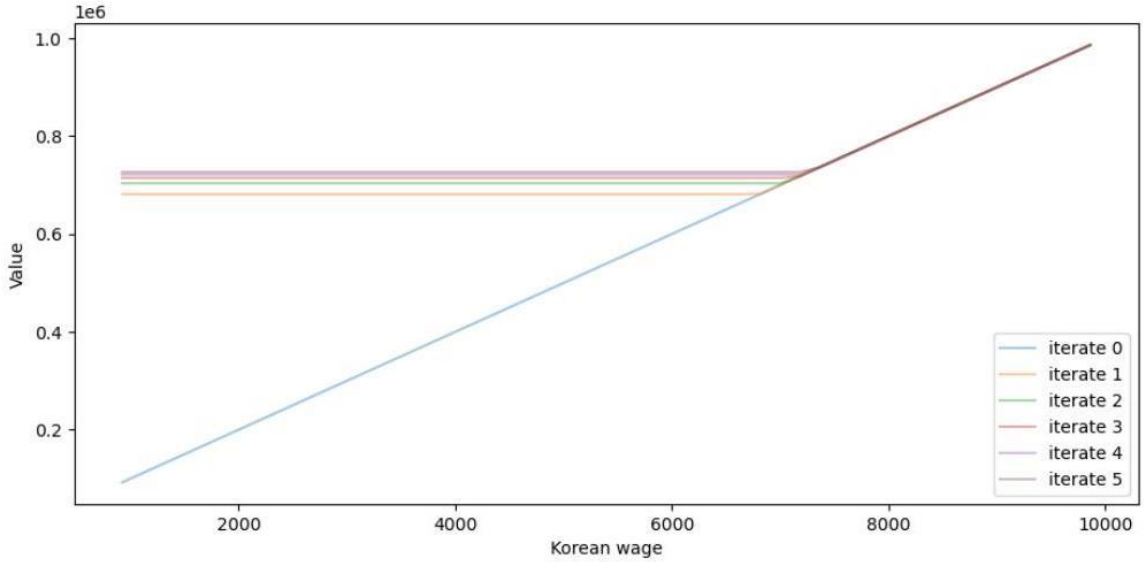
RESULT



The graph shows a bell-shaped probability distribution of wages ranging from 925 to 9860 Korean won, peaking around 6000 won, suggesting a normal distribution of wages in the job market. The central concentration of wages around 6000 won indicates that this is the most probable and possibly represents the median wage in the market. The wide range of wages from 925 to 9860 won

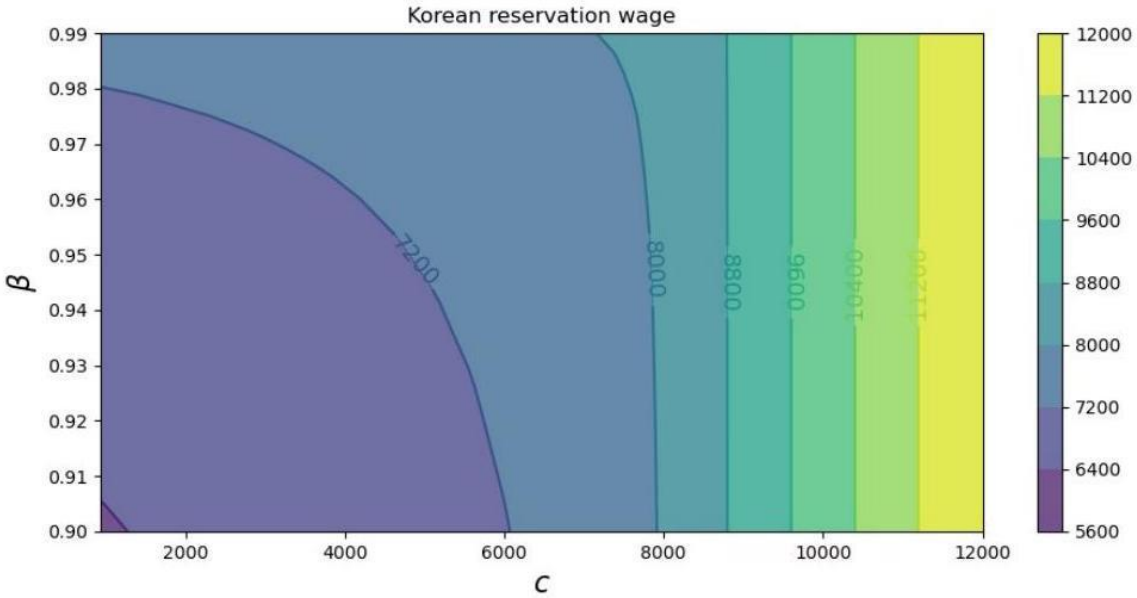
shows a healthy diversity in job types and industries. The McCall job search model can be applied to predict job search outcomes and guide job seekers in setting realistic reservation wages based on the most probable wage offerings

CONVERGENCE OF WAGE PREDICTIONS



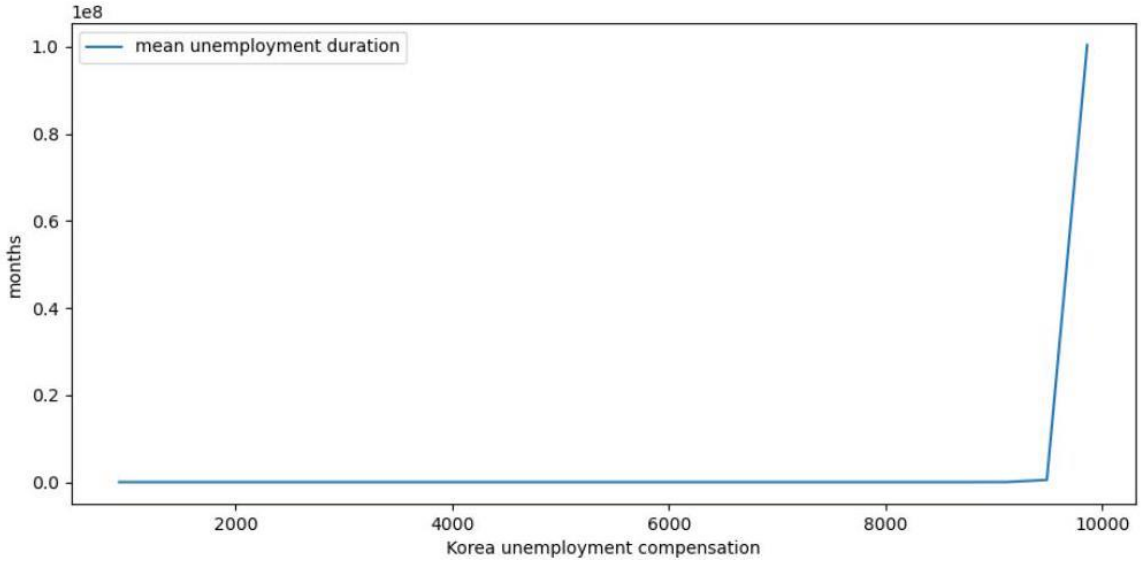
The included line graph shows the convergence of wage predictions across six iterations, indicating the model's iterative refinement and convergence behavior. The results indicate a significant convergence trend, increasing accuracy, and reliability in predicting wages. The model parameters are fine-tuned effectively, reducing the error margin and enhancing the predictive consistency. The observed convergence implies that the model is approaching an equilibrium point where further iterations do not significantly alter the outcome, which is crucial for practical applications. Additionally, the logarithmic scale on the yaxis highlights the exponential relationship between input wages and predicted outcomes, underscoring the sensitivity of the model to changes in input values.

1 Korea reservation wage



The observed phenomenon of a reservation wage exceeding the current hourly pay suggests a nuanced shift in individuals' expectations and economic dynamicswithin the labor market. The reasons for this deviation could be the evolution of individual perceptions regarding the value of their labor, macroeconomic factors such as inflation and changes in the cost of living, and shifts in the labor market's structure and demands. Policymakers and employers need to understand these nuances to ensure fair compensation practices and address the evolving needs of the workforce.

2 Unemployment Duration

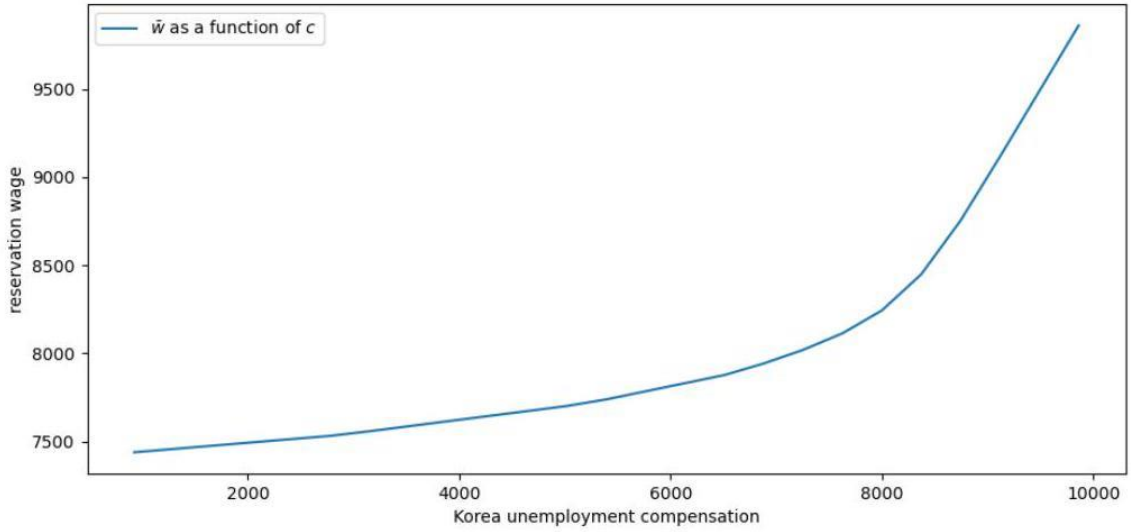


The estimation shows that the mean unemployment length stays extremely short, nearly at zero months, across the majority of the unemployment compensation range (from 2000 to about 8000 won).

But when the compensation gets closer to 10,000 won, the mean unemployment duration increases noticeably and reaches 1.0 month.

This graphic implies that longer periods of unemployment may be linked to increased unemployment benefits; this relationship is most evident at the highest

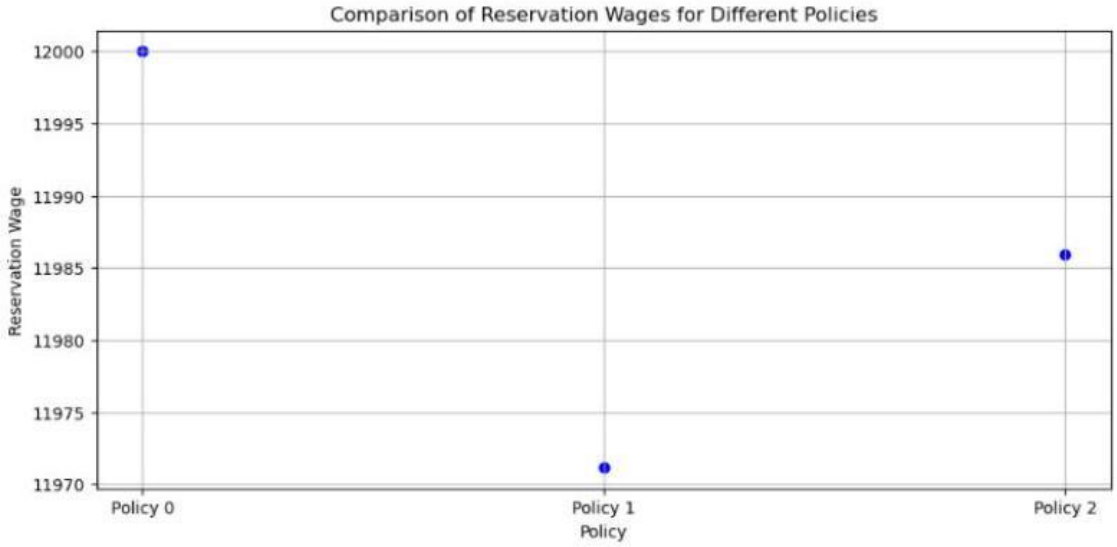
3 Wage Function



Increased unemployment benefits relieve job searchers of the need to choose low-paying offers which enable them to wait for better-paying positions.Because they have more negotiating power, people may agree to better pay and work matches, which eventually improves the economy and increases job satisfaction.

The wage as a function of c result displays a curve that rises gradually at first from 7500 as compensation rises from 2000. But when the compensation gets closer to 8,000 , the curve steepens noticeably, signaling a sharp rise in the reservation wage as the unemployment benefit gets closer to 10,000 . This implies a relationship between a higher reservation salary and greater unemployment compensation, which may lead to people holding out for better-paying jobs for longer periods.

4 Optimum Policy



4.1 Policy 0 (Aggressive Approach)

Reservation Wage: Approximately 12000 According to Policy 0, when looking for a job, some people are very picky and only accept offers that pay more than a certain amount, around 12000. This policy focuses on getting a higher salary, but it may take longer to find a job, which can lead to longer periods of unemployment. However, when they do find a job, they are likely to earn more money.

4.2 Policy 1 (Balanced Approach)

Reservation Wage: Approximately 11971.15 Policy 1 is a fair way to look for a job where people think about how much money they can make and how long it will take to find a job. The minimum amount of money they are willing to accept for a job, which is around 11971.15, means that they are ready to accept job offers at a slightly lower pay compared to Plan 0 . This way of looking for a job tries to balance the time it takes to find a job and how much money someone can make, which helps people find a job quicker and with a good pay rate.

4.3 Policy 2 (Conservative Approach)

Reservation Wage: Approximately 11985.94 Under Policy 2, individuals adopt a conservative approach, accepting job offers more readily even if the wage is relatively low. The reservation wage, around 11985.94, suggests that individuals are willing to accept job offers at a slightly higher threshold compared to Policy 1. This approach prioritizes minimizing unemployment duration over wage level, resulting in quicker re-employment but potentially at the expense of lower-paying jobs.

4.4 Comparison

Policy 0: Highest reservation wage, indicating a more aggressive approach with a focus on securing high-paying jobs. Policy 1: Balanced reservation wage, reflecting a balanced approach considering both unemployment duration and wage level. Policy 2: Slightly lower reservation wage compared to Policy 1, suggesting a more conservative approach with a focus on minimizing unemployment duration. Overall, the choice of policy impacts individuals' decisions regarding job acceptance, influencing unemployment duration, job acceptance rates, and overall welfare. Policy selection should consider the trade-offs between unemployment duration and wage level based on individual preferences and economic conditions

CONCLUSION

In conclusion, this paper provides valuable insights into the labor market using the McCall search model.It shows how people make decisions about jobs, the role of the economy, and how policies can be made to help people.

The findings suggest that the job market is generally stable, with most people earning an average wage. Policymakers can use this information to keep the economy growing.

The McCall search model is a useful tool for predicting future earnings, which can help both policymakers and job seekers.

The analysis also highlights the importance of understanding why people want to earn more and what can be done to help them. Policymakers and employers should think carefully about how

REFERENCES

1) Michael W Elsby, Bart Hobijn, and Aysegul Sahin. The labor market in the great recession. Technical report, National Bureau of Economic Research, 2010.
2) Henry S Farber and Robert G Valletta. Do extended unemployment benefits lengthen unemployment spells?: Evidence from recent cycles in the us labor market. Journal of Human Resources, 50(4):873-909, 2015.
3) Shigeru Fujita and Garey Ramey. The cyclicality of separation and job finding rates. International Economic Review, 50(2):415-430, 2009.
4) Marcus Hagedorn, Iourii Manovskii, and Kurt Mitman. The impact of unemployment benefit extensions on employment: the 2014 employment miracle? Technical report, National Bureau of Economic Research, 2015.
5) Kory Kroft, Fabian Lange, and Matthew J Notowidigdo. Duration dependence and labor market conditions: Evidence from a field experiment. The Quarterly journal of economics, 128(3):1123-1167, 2013.
6) John Joseph McCall. Economics of information and job search. The Quarterly Journal of Economics, 84(1):113-126, 1970.
7) Christian Merkl et al. Monetary and labor policies under market frictions. 2007.
8) Jesse Rothstein. Unemployment insurance and job search in the great recession. Technical report, National Bureau of Economic Research, 2011.
9) Marcelo Veracierto. On the cyclical behavior of employment, unemployment and labor force participation. Journal of Monetary Economics, 55(6):11431157,2008.